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A
For controlling the melt-flow behavior of said melt-flowable composition, such that said melt-flowable composition contacts said surface,

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said film comprising a substantially smooth, paint-receptive surface comprising a (thermosetting) epoxy-polyester blend;

(b) heating said laminate to cause said melt-flowable composition to flow over and substantially cover a desired area of said surface to adhere said laminate to said surface,

said dimensionally stable film controlling the melt-flow behavior of said melt-flowable composition to substantially confine said melt-flowable composition to said desired area of said surface; and

(c) allowing said laminate to cool while substantially retaining said substantially smooth surface topography of said film.

30. (New) A method according to claim 29 wherein said dimensionally stable film comprises a (B-staged) epoxy-polyester blend.

31. (New) A method according to claim 29 wherein said dimensionally stable film comprises an oriented polyester film provided on one surface with a (thermosetting) epoxy-polyester blend.

REMARKS

The present invention relates to a method for modifying the surface of a substrate using a laminate that includes a melt-flowable composition and a dimensionally stable film for

controlling the melt-flow properties of the composition. The dimensionally stable film has an initial surface topography (e.g., a substantially smooth topography) that is preserved following application of the laminate to the substrate, and subsequent heating and cooling steps.

At the outset, it is important to note two things about the claimed invention. First, all of the claims are method claims, directed towards a specific use of the laminate. Second, the laminate itself is specifically engineered for this particular use. It is more than simply a generic adhesive placed on a surface of a generic backing. To understand the significance of these two points requires an understanding of the problem confronting the inventors when they made their discovery.

One of the inventors' objectives was to develop a sealing composition for use, e.g., in sealing automotive roof ditches that was effective, yet easy to use. Previously, PVC plastisol pastes had been used for this purpose. These plastisols were messy and highly user-dependent, often resulting in imperfect seals.

In order to prevent gaps that could lead to leaks, the inventors recognized that they needed a sealing composition that flowed when heated to wet the surface being sealed. However, they also recognized the importance of avoiding uncontrolled flow (a problem associated, e.g., with the PVC plastisols) to ensure that the composition only wet the designated area of the substrate. The inventors further recognized that at least in some instances, it would be desirable to control the shrinkage of

the composition, preferably confining shrinkage primarily to the downweb direction. For example, in the case of roof ditch moldings, controlling shrinkage in this manner minimizes the formation of drips or balls of sealant in the end of the roof ditch (where tolerances are tight). Such drips or balls prevent the roof ditch molding from fitting properly, resulting in leakage.

Another problem confronting the inventors was the surface that resulted following application of the sealing composition. Because the material readily and uncontrollably flowed, the resulting surface was often irregular and bumpy. This presented several problems. First, in the case where it was desired to bond, e.g., a decorative molding over the surface, the bumps led to gaps between the sealant surface and the molding, resulting in delamination. Second, in applications requiring a painted surface (e.g., where the surface was designed to be visible), the bumps caused the paint to crack and flake off.

The solution the inventors discovered was to combine the melt-flow composition with a dimensionally stable film for controlling the melt-flow behavior of the composition. The film was selected such that it had a higher modulus than the underlying melt-flow composition and resisted flowing under the elevated temperatures used to cause the underlying melt-flow composition to flow and wet the substrate. The film was also selected such that it retained its surface topography following processing. Thus, for example, if the surface was initially smooth, it remained smooth following processing, thereby

facilitating bonding and painting steps. On the other hand, if it bore an embossed design, that design remained substantially unaltered following processing.

With these objectives in mind, claims 1-5 have been cancelled, and claims 6-31 substituted therefor, to more clearly define the invention. Support for these amendments is found in the specification at page 6, line 11 to page 9, line 2; page 11, line 1 to page 12, line 26; and page 27, line 4 to page 30, line 12. The specification has also been amended as the Examiner suggested to correct minor informalities.

With the invention now properly placed in context through the above amendments and remarks, it is apparent that the claimed invention is neither anticipated by, nor obvious in view of, any of the cited art. None of the cited references (Otonari, Kumanoya, Worth, Pletcher, Rinde), alone or in combination, teaches applying to a substrate a laminate that includes a melt-flowable composition and a dimensionally stable film specifically engineered for controlling the melt-flow properties of the composition, while preserving the initial surface topography of the dimensionally stable film following application of the laminate to the substrate, and subsequent heating and cooling steps.

Otonari describes a cellular polyester film having a rough surface and a paint-receptive adhesive for use in applications such as magnetic telephone cards. There is no suggestion to use the resulting laminate in a melt-flow application, much less a teaching to use laminates in which the

backing and adhesive are specifically designed for use in this application.

Kumanoya describes improving adhesion between a polyolefin and a hot melt adhesive by priming the polyolefin surface. The adhesive is applied in molten form to the primed surface and, while the adhesive is still molten, a second substrate is added. This is very different from the claimed invention, in which the dimensionally stable film/melt-flow composition laminate is placed on a substrate and then heated to effect a bond.

Worth describes a microporous film provided with a hot melt adhesive. During processing a heated die contacts the film surface to change the appearance of the surface. This is the opposite of the claimed process, in which the initial surface topography of the dimensionally stable film is preserved during processing.

Pletcher describes bonding a thermoplastic polymer to a substrate by heating the polymer until it reaches a molten state, cooling the polymer to a point where it becomes tacky, and then contacting it with the substrate. Although Pletcher describes providing the polymer in the form of a tape with various backings, he specifically envisions using the composition in the form of a transfer tape in which the backing (if present) is removed prior to use (see col. 9, lines 15-38). Therefore, Pletcher teaches melt-flowable compositions presenting the type of problem the present invention is designed to overcome.

Rinde merely describes adhering a heat-recovering article to a substrate such as a pipe using an amorphous thermosetting adhesive, e.g., a blend of an amorphous polyester and epoxy resin. There is no disclosure of a dimensionally stable film.

In light of the above, it is respectfully requested that the outstanding rejections under §§102 and 103 be withdrawn.

Turning to the remainder of the Office Action, for the sake of completeness applicants elect with traverse to prosecute the claims of Group I (claims 1-4). However, applicants further respectfully submit that the cancellation of claims 1-5 moots the restriction requirement. The cancellation of claims 1-5 also moots the outstanding rejection of these claims under §112, second paragraph, and the objection to the specification based upon the inclusion of the phrase "priming layer" in now-cancelled claim 5.

With respect to the Examiner's request for product specifications relating to the two film materials identified at page 29, lines 6-12 of the specification (Teslin and Melinex), applicants note that they submitted product literature relating to Teslin in an Information Disclosure Statement mailed August 11, 1995. This literature sets forth properties for the Teslin material. Applicants are attempting to locate literature relating to the Melinex product.

Applicants further request that the Examiner consider and initial all of the entries in all of the PTO 1449 Forms

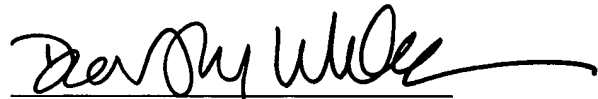
submitted to date to ensure that all art of record has been considered.

In view of the above, it is respectfully submitted that all of the claims now in the application are in condition for allowance, and such action is requested. If there are any additional charges, or any credits, please apply them to Deposit Account No. 06-1050.

Respectfully submitted,

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